

What is claimed is:

1. An overheat prevention apparatus for preventing overheating from occurring due to unintended long-time use of a gas range, the overheat prevention apparatus comprising:

5 a thermocouple, which is installed at a burner of the gas range and generates a thermoelectromotive force due to burner fire;

a magnetic opening/closing unit, which generates a magnetic force due to the thermoelectromotive force of the thermocouple so as to selectively open or close a gas supply passage; and

10 a timer switch, which is installed between one output terminal of the thermocouple and one input terminal of the magnetic opening/closing unit, electrically disconnects circuits the two terminals in an "OFF" status and an end-of-set status, and electrically connects the two terminals while a time setup is maintained.

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2. A gas range, which generates heat using gas as fuel, comprising:

a burner, which generates fire by burning gas; and

an overheat prevention apparatus comprising:

20 a thermocouple, which is installed at the burner and generates a thermoelectromotive force due to burner fire;

a magnetic opening/closing unit, which generates a magnetic force due to the thermoelectromotive force of the thermocouple so as to selectively open or close a gas supply passage through which the gas is supplied to the burner; and

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a timer switch, which is installed between one of two output terminals of the thermocouple and one of two input terminals of the magnetic opening/closing unit, electrically disconnects circuits the two terminals in an "OFF" status and an end-of-set status, and electrically connects the two terminals while a time setup is maintained.

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3. The gas range of claim 2, wherein the gas range is a gas range for cooking, which uses liquefied petroleum gas (LPG) or liquefied natural gas (LNG) as fuel.

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4. The gas range of claim 3, wherein the gas range for cooking comprises:

a plurality of burners;

a plurality of thermocouples for the respective burners; and

10 a plurality of magnetic opening/closing units corresponding to the plurality of thermocouples, respectively, and

the timer switch comprises a plurality of switches, each of which electrically connects or disconnects one of two output terminals of each thermocouple and one of two input terminals of a magnetic opening/closing unit corresponding to the thermocouple, the timer switch
15 turning off all of the switches in the "OFF" status and the end-of-set status and turning on all of the switches while the time setup is maintained.

20 5. The gas range of claim 2, wherein the gas range is a gas stove using LPG or LNG as fuel.

6. The gas range of claim 2, wherein the gas range is a portable gas range using portable butane gas as fuel.

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7. An electronic overhear prevention apparatus for safely opening or closing a gas supply passage of a gas range including at least one burner, the electronic overhear prevention apparatus comprising:

30 a power supply unit, which supplies direct current (DC) power having a predetermined electromotive force;

at least one thermal sensor, which senses heat of a corresponding burner and generates a thermoelectromotive force;

an input button unit, which receives an operating time control signal for each burner from a user;

5 at least one magnetic opening/closing unit, which maintains a gas supply passage to a corresponding burner when a electromagnetic force is maintained and closes the gas supply passage when the electromagnetic force is lost;

a digit display unit, which displays an operating time for each
10 burner in digits; and

a control circuit unit, which controls a electromagnetic force to be supplied to each magnetic opening/closing unit when a thermoelectromotive force of a thermal sensor corresponding to the magnetic opening/closing unit exceeds a predetermined threshold value,
15 controls the electromagnetic force supplied to the magnetic opening/closing unit to be intercepted when an operating time lapses or when the thermoelectromotive force of the thermal sensor does not exceed a predetermined threshold value, and controls and manages an operating time of each burner, which is generated by adjusting a
20 predetermined reference operating time according to the operating time control signal, as time flows,

wherein when the operating time control signal for a burner is not received from the input button unit, the control circuit unit controls a electromagnetic force, which is supplied to a magnetic opening/closing
25 unit corresponding to the burner, to be intercepted after the predetermined reference operating time lapses.

8. The electronic overheat prevention apparatus of claim 7, further comprising at least one operation indicator lamp, which indicates
30 whether a corresponding burner is ignited,

wherein the control circuit unit controls a electromagnetic force to be supplied to a corresponding magnetic opening/closing unit and simultaneously controls electric power to be supplied to a corresponding operation indicator lamp.

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9. The electronic overheat prevention apparatus of claim 7, further comprising:

a gas sensor, which senses ambient gas and generates an electromotive force; and

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a speaker, which generates an alarm sound,

wherein the control circuit unit controls the speaker to generate the alarm sound when an electromotive force from the gas sensor exceeds a predetermined threshold value.

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10. The electronic overheat prevention apparatus of any one of claims 7 through 9, wherein the control circuit unit comprises:

a thermoelectromotive amplifier, which amplifies a thermoelectromotive force received from each thermal sensor and turns on a thermal detection signal when the amplified thermoelectromotive force exceeds a predetermined threshold value;

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a clock oscillator, which generates a clock signal;

a microcomputer, which turns on a burner control signal in order to control a electromagnetic force to be supplied to a magnetic opening/closing unit corresponding to the thermal sensor when the thermal detection signal is turned on, gradually decreases the reference operating time or the operating time of each burner according to time information managed by the clock signal of the clock oscillator, and turns off the burner control signal in order to control the electromagnetic force, supplied to the magnetic opening/closing unit, to be intercepted when the reference operating time or the operating time reaches 0 or when the thermal detection signal is turned off; and

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a digit formation signal generator, which receives reference operating time data or operating time data of each burner from the microcomputer, generates a digit formation signal corresponding to the received data, and transmits the digit formation signal to the digit display unit.

11. A gas range, which generates heat using gas as fuel, comprising:

a gas supply unit, which supplied gas;
at least one burner, which generates fire by burning the supplied gas; and

an electronic overheat prevention apparatus comprising:

a power supply unit, which supplies direct current (DC) power having a predetermined electromotive force;

at least one thermal sensor, which senses heat of a corresponding burner and generates a thermoelectromotive force;

an input button unit, which receives an operating time control signal for each burner from a user;

at least one magnetic opening/closing unit, which maintains a gas supply passage to a corresponding burner when a electromagnetic force is maintained and closes the gas supply passage when the electromagnetic force is lost;

a digit display unit, which displays an operating time for each burner in digits; and

a control circuit unit, which controls a electromagnetic force to be supplied to each magnetic opening/closing unit when a thermoelectromotive force of a thermal sensor corresponding to the magnetic opening/closing unit exceeds a predetermined threshold value, controls the electromagnetic force supplied to the magnetic opening/closing unit to be intercepted when an operating time lapses or when the thermoelectromotive force of the thermal

sensor does not exceed a predetermined threshold value, and controls and manages an operating time of each burner, which is generated by adjusting a predetermined reference operating time according to the operating time control signal, as time flows,

5 wherein when the operating time control signal for a burner is not received from the input button unit, the control circuit unit controls a electromagnetic force, which is supplied to a magnetic opening/closing unit corresponding to the burner, to be intercepted after the predetermined reference operating time lapses.

10 12. The gas range of claim 11, wherein the electronic overheat prevention apparatus further comprises at least one operation indicator lamp, which indicates whether a corresponding burner is ignited,

15 wherein the control circuit unit controls a electromagnetic force to be supplied to a corresponding magnetic opening/closing unit and simultaneously controls electric power to be supplied to a corresponding operation indicator lamp.

20 13. The gas range of claim 11, wherein the electronic overheat prevention apparatus further comprises:

a gas sensor, which senses ambient gas and generates an electromotive force; and

a speaker, which generates an alarm sound,

25 wherein the control circuit unit controls the speaker to generate the alarm sound when an electromotive force from the gas sensor exceeds a predetermined threshold value.

14. The gas range of any one of claims 11 through 13, wherein the control circuit unit comprises:

30 a thermoelectromotive amplifier, which amplifies a thermoelectromotive force received from each thermal sensor and turns

on a thermal detection signal when the amplified thermoelectromotive force exceeds a predetermined threshold value;

a clock oscillator, which generates a clock signal;

a microcomputer, which turns on a burner control signal in order to
5 control a electromagnetic force to be supplied to a magnetic
opening/closing unit corresponding to the thermal sensor when the
thermal detection signal is turned on, gradually decreases the reference
operating time or the operating time of each burner according to time
information managed by the clock signal of the clock oscillator, and turns
10 off the burner control signal in order to control the electromagnetic force,
supplied to the magnetic opening/closing unit, to be intercepted when the
reference operating time or the operating time reaches 0 or when the
thermal detection signal is turned off; and

a digit formation signal generator, which receives reference
15 operating time data or operating time data of each burner from the
microcomputer, generates a digit formation signal corresponding to the
received data, and transmits the digit formation signal to the digit display
unit.